

Appendix 1: Supplementary methods [posted as supplied by author]

Deaths among law enforcement officers

Three major national databases track U.S. police deaths in the line of duty: the Census of Fatal Occupational Injuries, the Law Enforcement Officers Killed and Assaulted reports, and the National Law Enforcement Officers Memorial Fund (NLEOMF). Of the three, only the NLEOMF systematically considers fatalities arising from medical conditions, such as cardiovascular disease, and consistently documents a larger number of annual fatalities than the other two databases. Given our intention to identify sudden cardiac death cases among U.S. law enforcement, we chose the NLEOMF as the study's primary database. Additional sudden cardiac death cases were identified from the Officer Down Memorial Page (ODMP). We restricted the study period from 1984 to 2010 because deaths occurring prior to 1984 were added to both the NLEOMF and ODMP databases after their inception, rendering earlier cases potentially susceptible to information bias.

Both the NLEOMF and ODMP systems are maintained by nonprofit organizations affiliated with law enforcement, to honor fallen U.S. police officers. Security officers for railroads, colleges and universities are also recognized as law enforcement officers if they have full arrest powers and/or hold a state police commission. Additionally, the ODMP recognizes "volunteer or auxiliary officers and deputies" who were granted powers of arrest while on duty. Both databases include police officers killed while in an "off-duty capacity" who responded to an emergency, public assistance request, or a violation of the law. The NLEOMF explicitly considers cases where the officer died while commuting to or from work.

Ascertainment of on-duty sudden cardiac death events

Likely sudden cardiac death cases were reviewed in a serial fashion to determine inclusion and to extract data. Cases were reviewed to determine eligibility and to extract data. A physician (VV) identified all deaths explicitly labeled as cardiovascular disease-related and selected cases consistent with on-duty sudden cardiac death. Two additional reviewers (AF, MK) independently assessed the accuracy of the selected cases and re-examined the remaining non-traumatic fatalities for further sudden cardiac death inclusions. A board-certified occupational physician (SNK) resolved any discrepancies about cause-of-death classifications.

Time spent on specific duties

Briefly, the first set of time estimates was derived from a survey of 951 frontline officers from the International Union of Police Associations (IUPA) and the Fraternal Order of Police (FOP) based on their own experience as police officers. The second set of estimates came from an independent population of 93 police chiefs who completed the survey based on the experience of typical patrol officers in their respective departments. Both surveys were IRB-approved. The participating chiefs represented 27% of 340 distinct law enforcement jurisdictions that had reported at least one sudden cardiac death case from a core group of 369 sudden cardiac death cases that were identified on a first pass through the NLEOMF and ODMP databases. Police chiefs were unaware that they were selected based on sudden cardiac death cases or that the present study explored sudden cardiac death-related hypotheses. Survey participants were informed that the study regarded stress in law enforcement.

Age at the time of the death – recovery of missing data

Both the ODMP and the NLEOMF databases include a field for the age at the time of the death; however, for 44 subjects (10%) information on age was missing from both databases. For SCD cases where age was missing from the databases, when possible we obtained the age based on available published obituaries found through internet searches. To retrieve missing data we analyzed comments left on the ODMP page, we collected information from the fallen officers' police departments (e.g., the memorial of Philadelphia Police Department, <http://www.phillyheroes.org/>); and we searched Google for obituaries (entering the complete name of the fallen officer along with the search term obituary). To validate the accuracy of the data retrieved by the above methods, we cross-checked the name, date and circumstances of death, and law enforcement employment in the retrieved information against the ODMP and NLEOMF database records. Using these methods, we were able to retrieve the age at the time of the death for 40 of the 44 officers with missing age data. The four cases with missing information on age were included in the group aged between 45-54 years (the category with the highest number of expected events).

